



STAR On-line Software

D. Olson, LBNL

STAR TAC Review
10-December-1996



Outline

- People
- Description of subsystem
- Requirements
- Current Status
- Plans
- Issues from 1995 TAC.
- Concerns
- Outlook



People

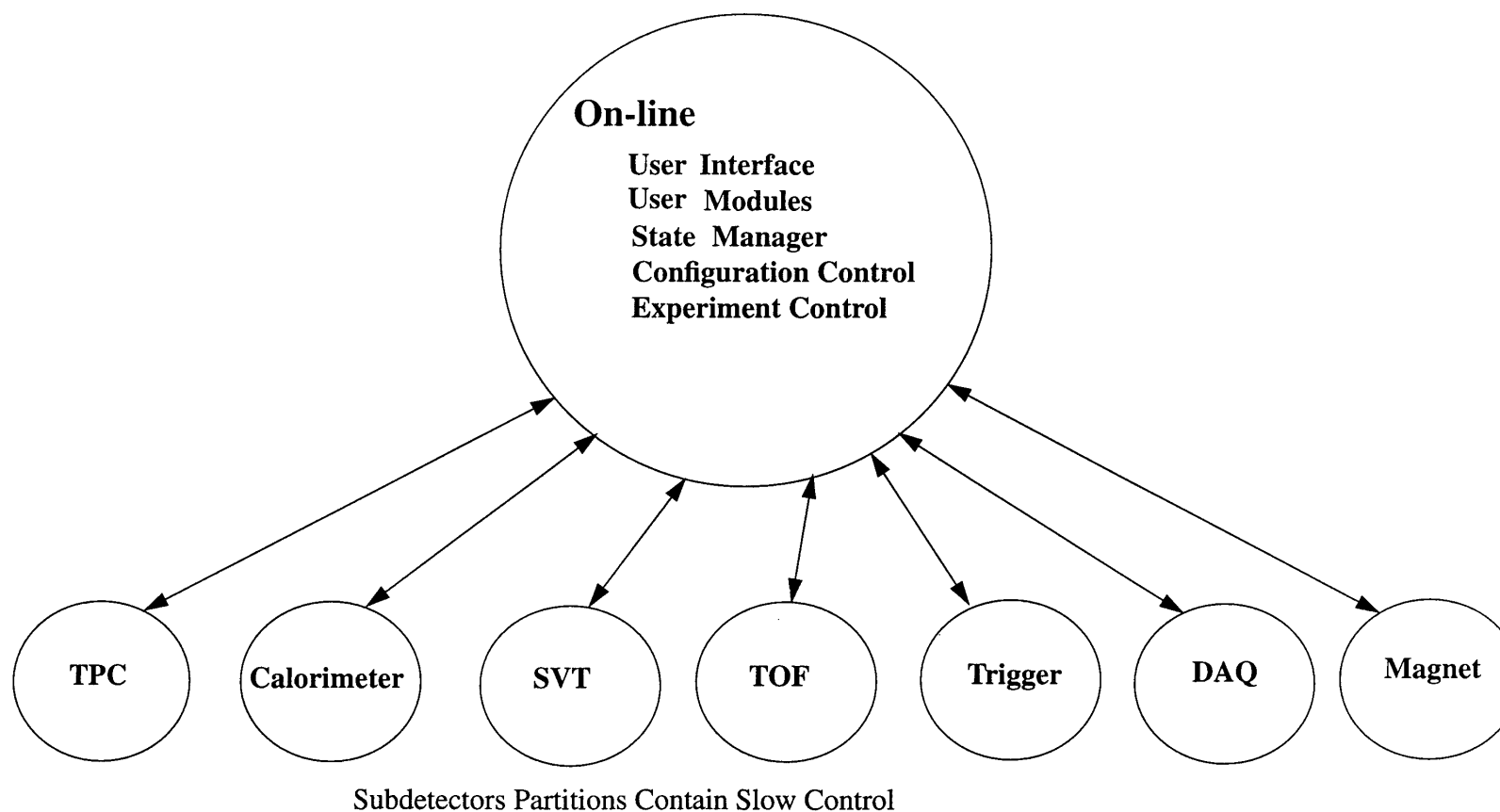
Person	FY96/FY97 FTE
D. Olson	0.3/0.0
W. Greiman	0.5/0.0
E. Yee	0.3/0.7

Contributors in FY96

J. Chrin, S. Jacobson, V. Lindenstruth, M. Lisa, C. McParland, I. Sakrejda, C. Tull



Description of On-line Software





Description of On-line Software

- The on-line software together with slow controls (interface to hardware), trigger, data acquisition and detector subsystems comprise the complete online system.
- The STAR online software provides the top level control and bookkeeping functions for the experiment.
- The functionality includes
 - Run Control operator interface
 - Central state manager & sequencer
 - Configuration Control & Archiving
 - Central Alarm & Message Logging
 - Monitoring
 - Calibration procedures
 - Data cataloging
 - Interface to off-line catalog
 - Partition for testing & integration



On-line Requirements

2.0 Executive Summary

The primary purpose of on-line software is to carry out effective operations of the experiment so that STAR accumulates the data it is supposed to and this data can be analyzed in a timely way for the proposed physics results.

On-line software is concerned with the following major functional categories:

- **Experiment Control**

The top level of everything that must be coordinated in the experiment in order for reliable and high-quality data to be taken.

- **STAR Controls**

The system through which the operating parameters of the experiment are controlled.

- **Configuration Management**

The ability to specify the set of software and components necessary for a particular running scenario in addition to the operating parameters for those components.

- **Calibration and Monitoring**

Calibration is the set of activities required to prepare parameter data that must be downloaded into the detector-DAQ-trigger sub-systems. Monitoring is the computation required to verify that the detector-DAQ-trigger sub-systems as well as the overall control system is functioning properly.

- **Data Management**

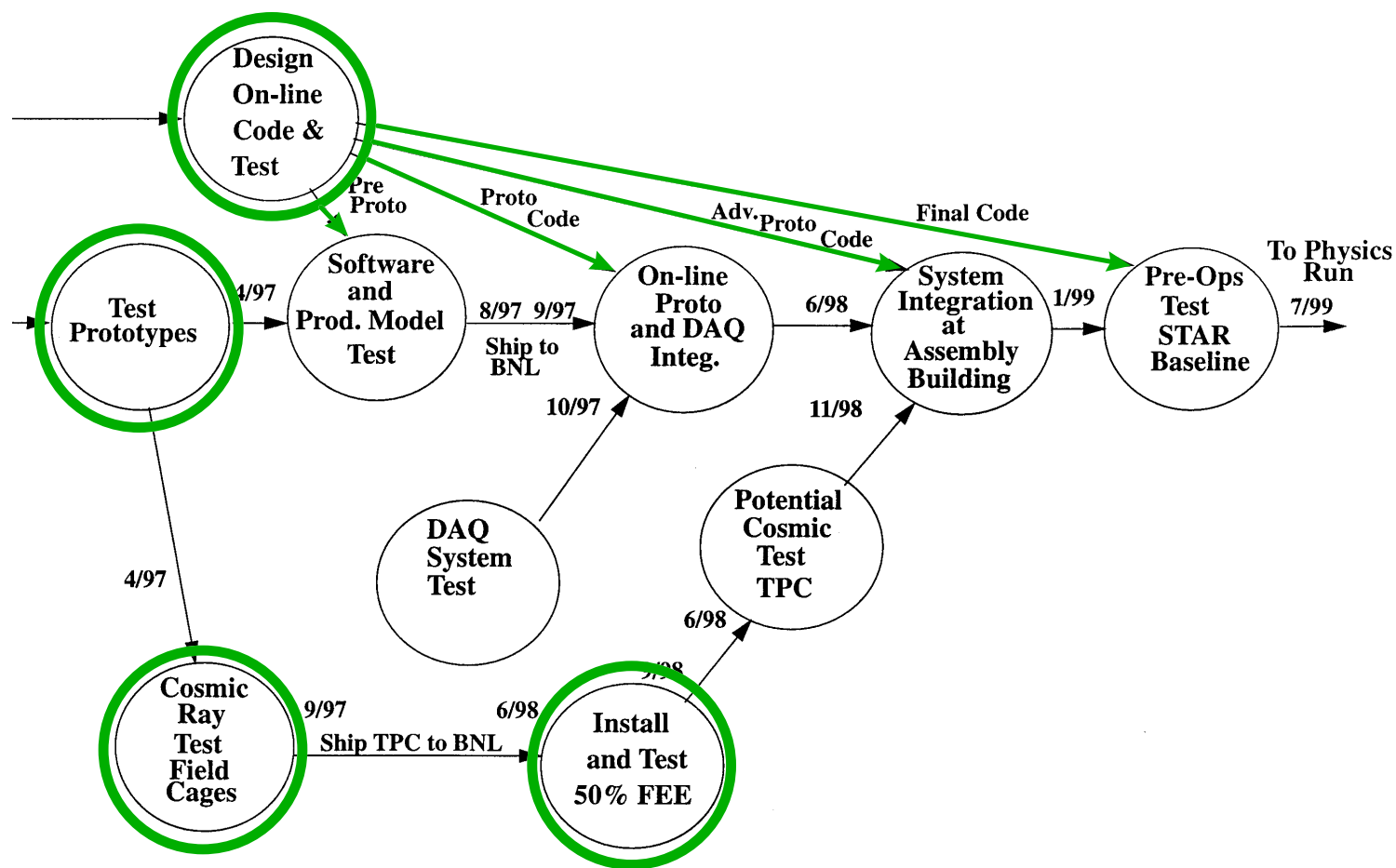
Provides a data storage and retrieval service for all on-line software and the means to cross reference the necessary information so that this data is both useful and accessible in a practical way.

- **User Interface**

A common user interface is defined for STAR controls.

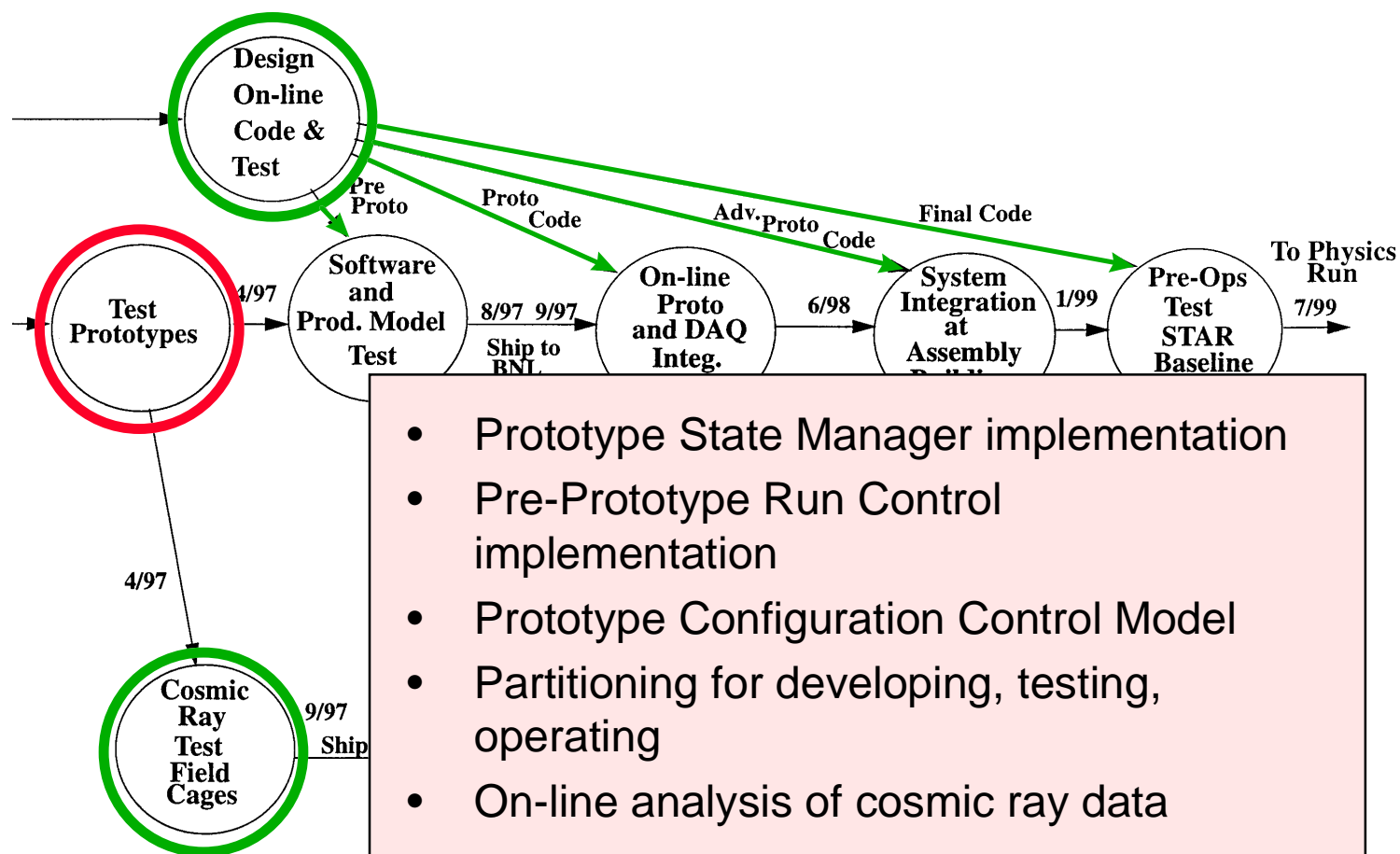


On-line Contribution to STAR Baseline Testing & Integration





Current Status





Prototype State Manager (SN0258)

On-line State Manager State Transition Models and Client API for STAR System Test

D. Olson

Submitted: 6-Sept-1996

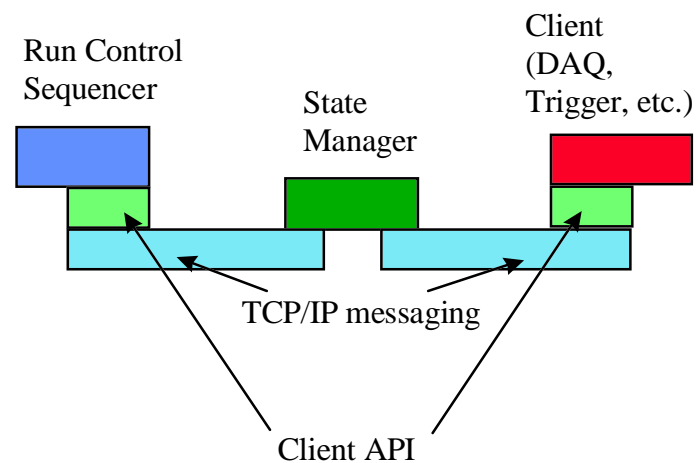
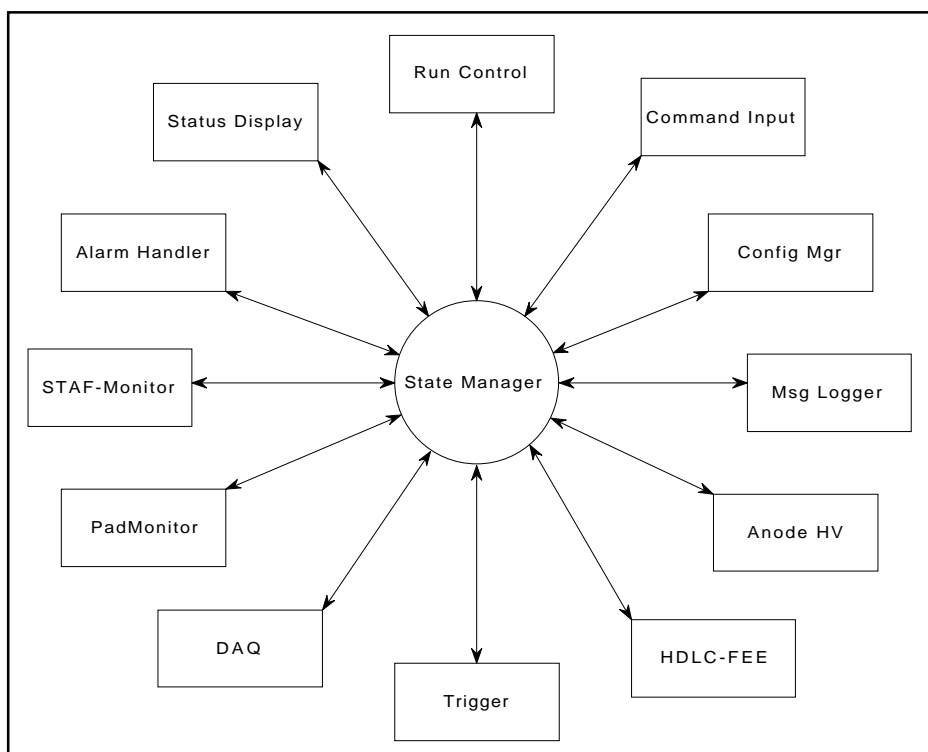
Revised: 12-Sept-1996

This document describes the state transition models and the programming interface used by client subsystems of the on-line state manager used for the STAR system test.

The prototype state manager described in this document exists in the onl/psm software package in the STAR software library. Additional documentation is available at
http://www.rhic.bnl.gov/star/starlib/doc/www/html/ssd_1/psm_1/psm.html.

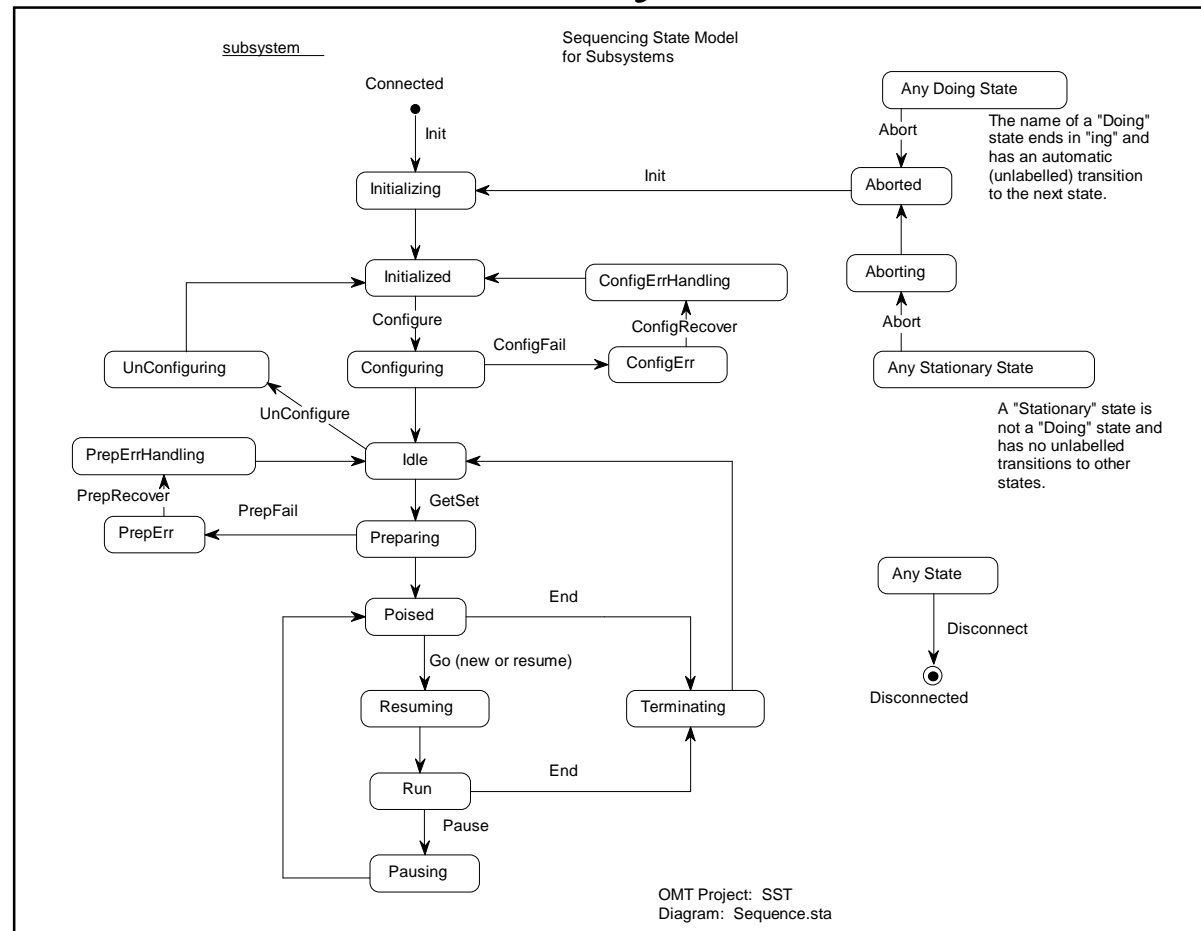


State Manager Architecture





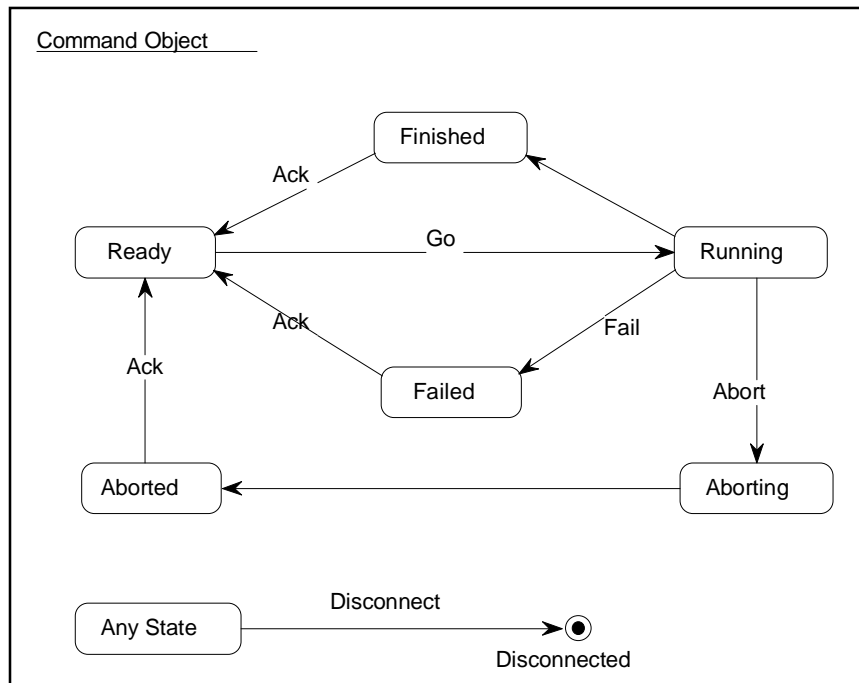
Sequencing State Model for Subsystems



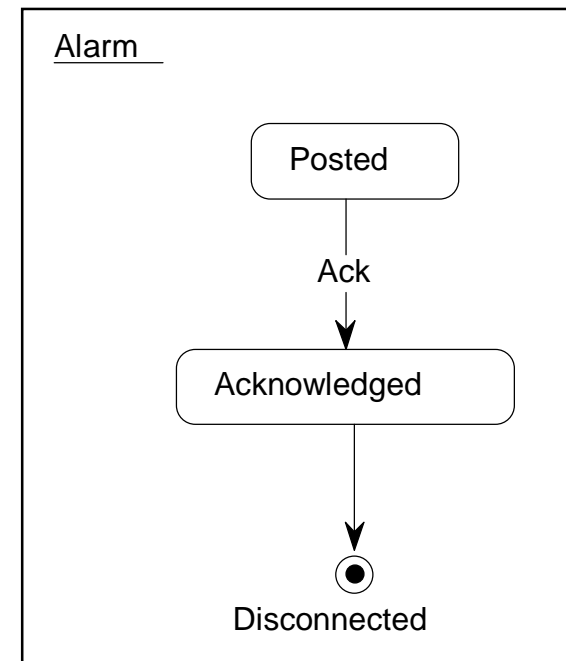


Command and Alarm State Models

Permits operator to issue commands to subsystems for finer grained control than major sequencing states.

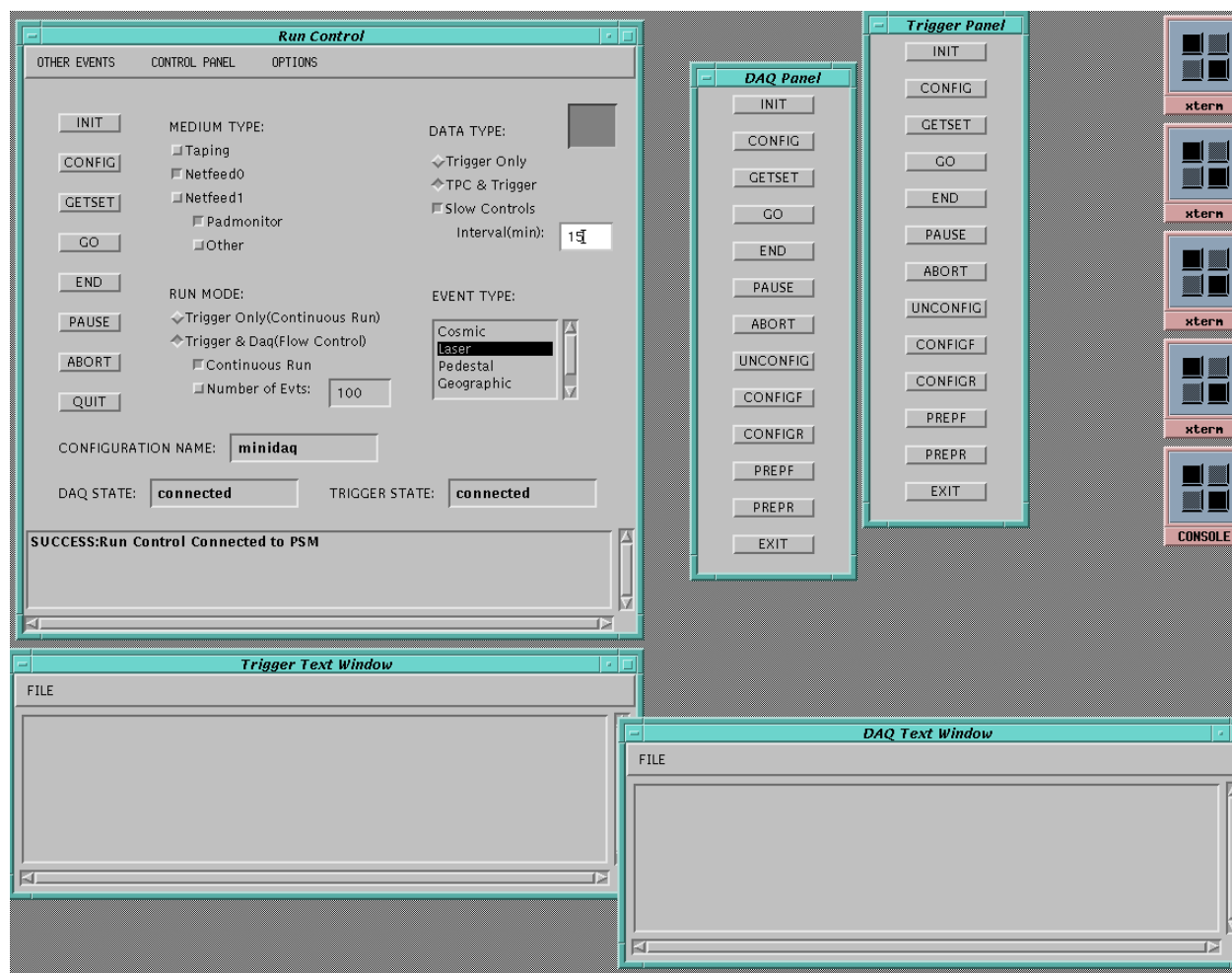


Permits subsystems to send an alarm condition to the operator, and requires an acknowledgement.





First Implementation Run Control



begin.psm script
 select seq aborting
 list
 wait 10 aborted
 select seq aborted
 list
 init
 wait 10 initialized
 select seq connected
 list
 init
 wait 10 initialized
 select seq initialized
 list
 configure \$*
 select seq *
 wait 10 idle
 list
 getset
 wait 10 poised
 list
 go
 wait 10 run
 list



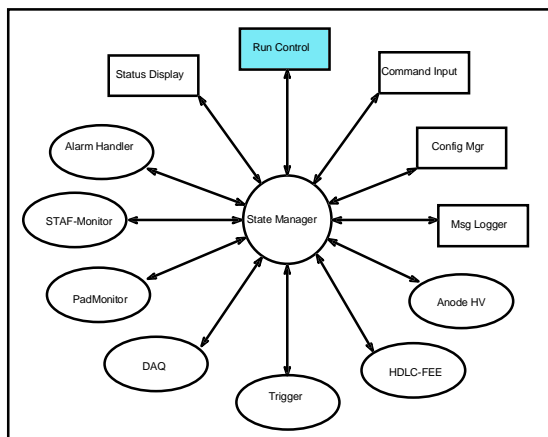
Configuration Control Model

- On-line “knows” of named configurations.
- Subsystems maintain contents of files corresponding to named configurations.
- Inter-subsystem dependencies are coordinated via these named configurations.

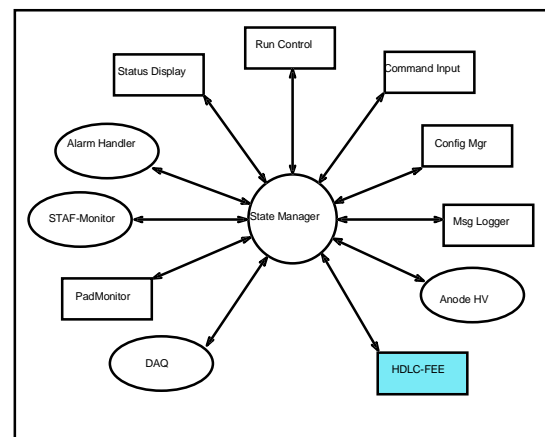


Partitioning & Testing

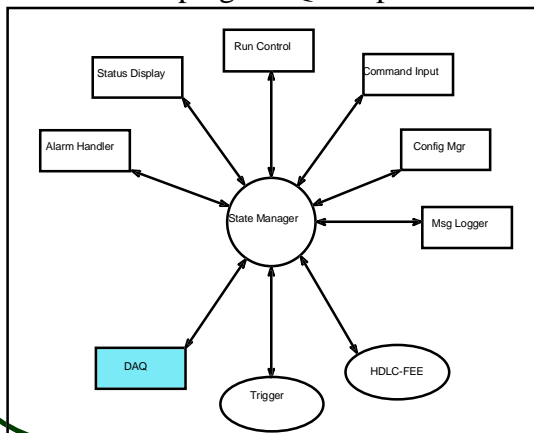
Developing Run Control





Developing HDLC component



Developing DAQ component



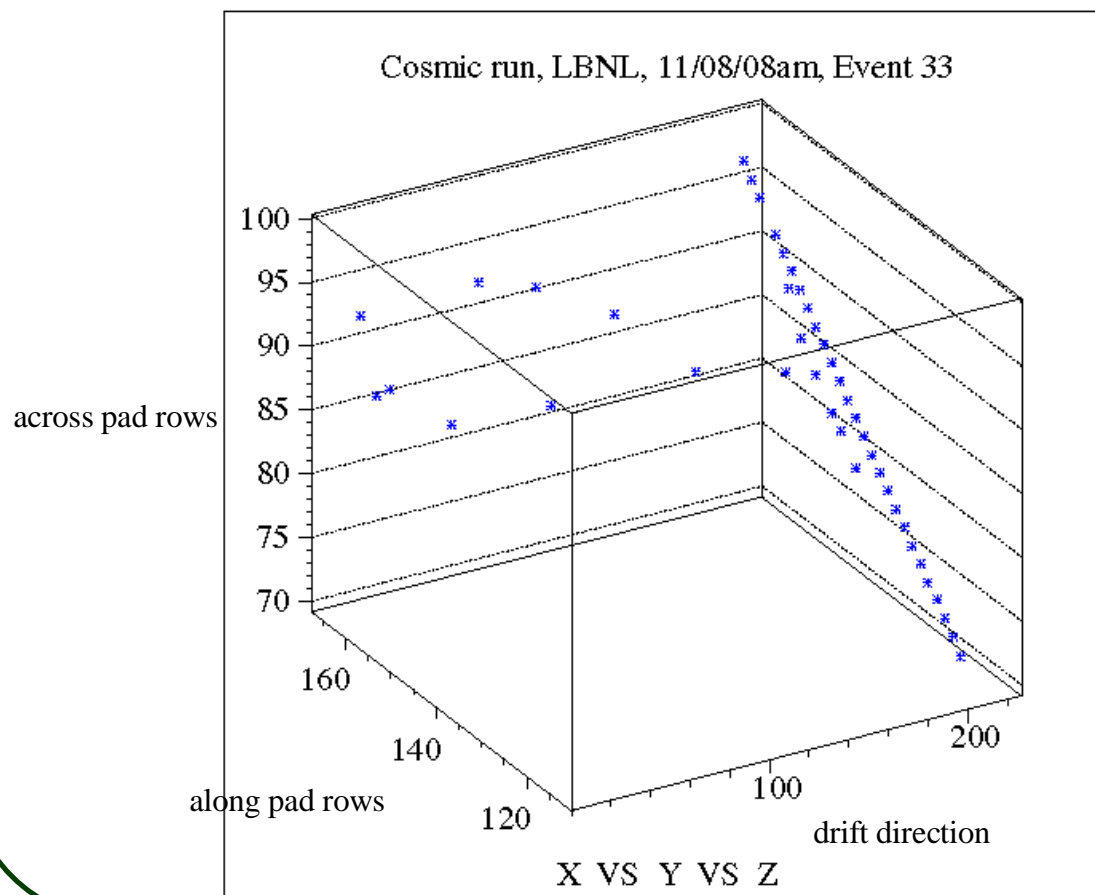
 “real” object

 “simulated” object

The system partitions for independent development and testing by running separate state managers on different computers.



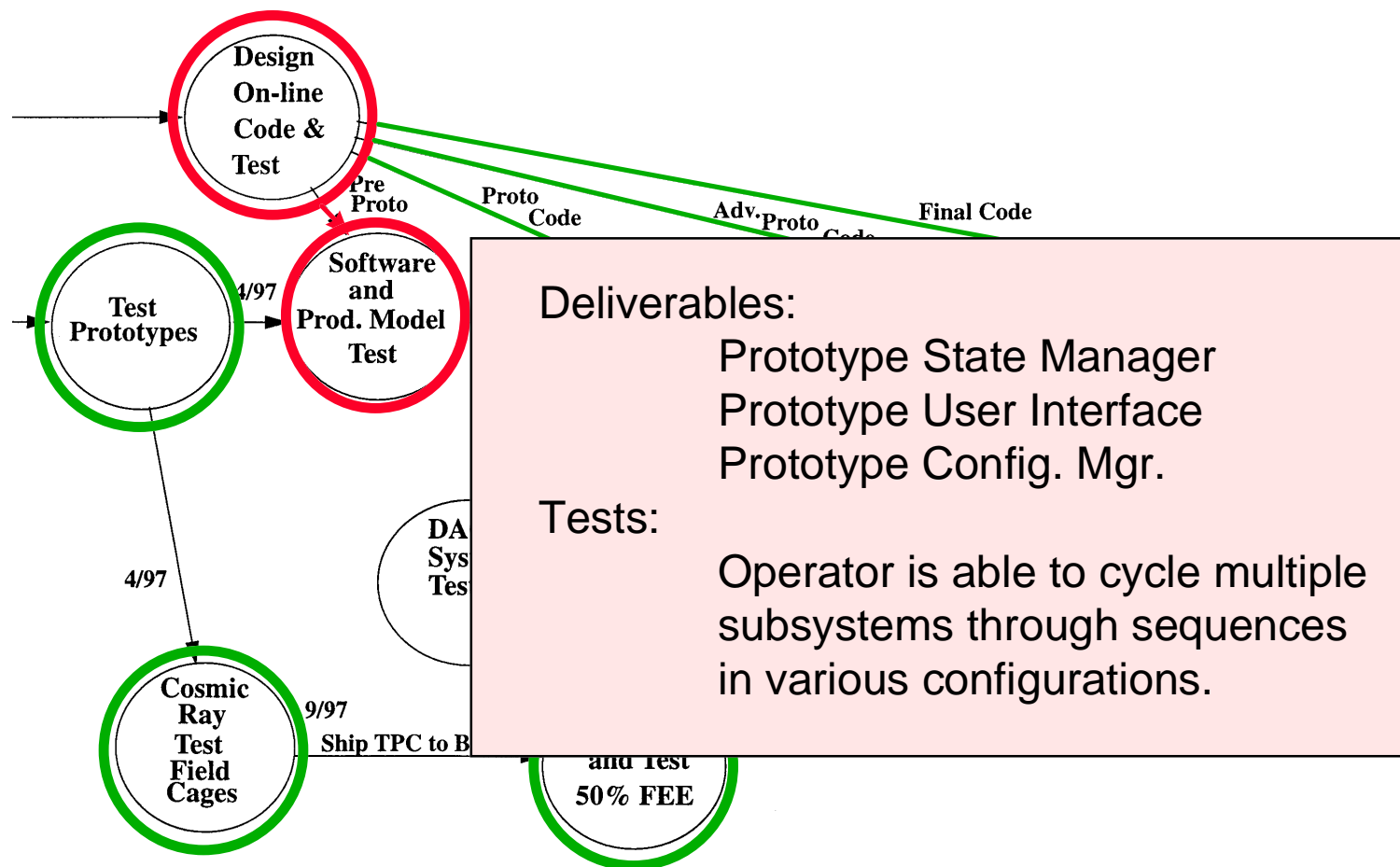
System Test Cosmic Track



Single sector system test.
Data flow:
2-scintillator coincidence
into STAR trigger,
TPC FEE + readout board,
Glink to Rosie (1960),
VME minidaq,
dataset library tables,
TCP/IP or tape,
STAF analysis

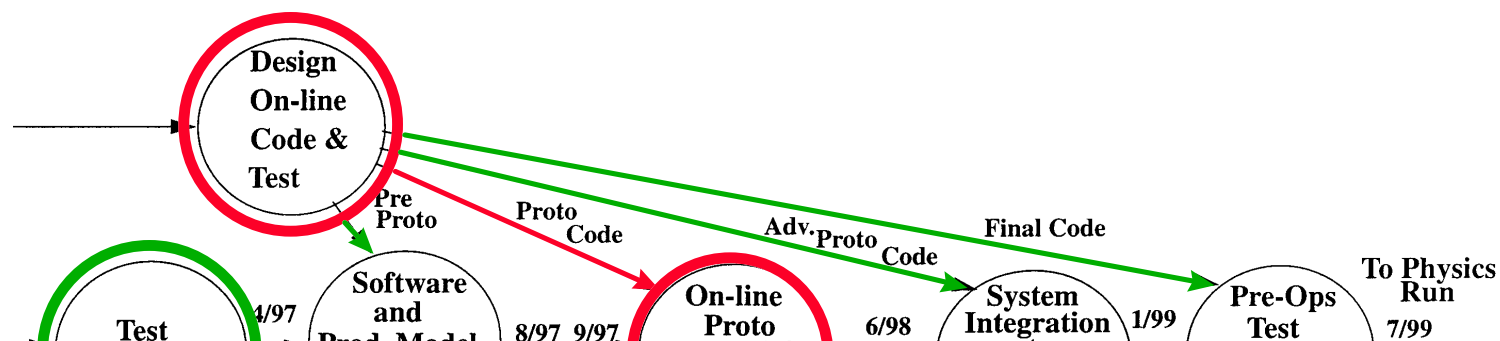


Software and Production Model Test





On-line Proto. and DAQ Integration



Deliverables:

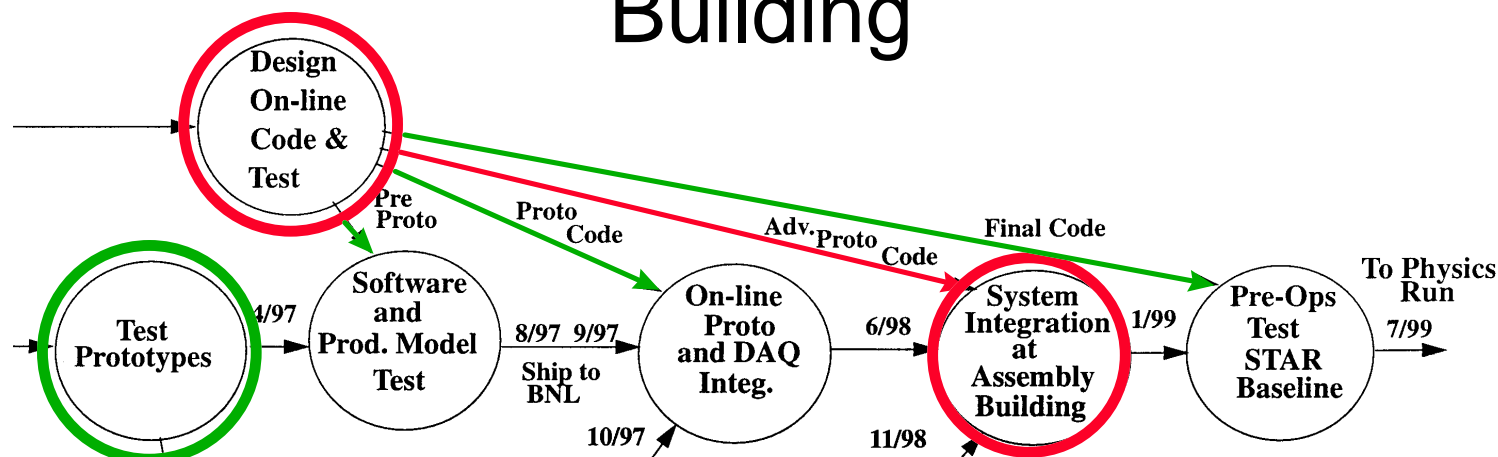
- Previous prototypes plus,
- Prototype data catalog (w/ interface to off-line)
- Event Server
- Alarm Handler
- Monitoring

Tests:

Operator is able to cycle system through example scenarios of complete system operations including begin/end run, save-restore configurations, calibration sequence, monitoring alarms...



System Integration at Assembly Building



Deliverables:

Fully functioning prototype software.

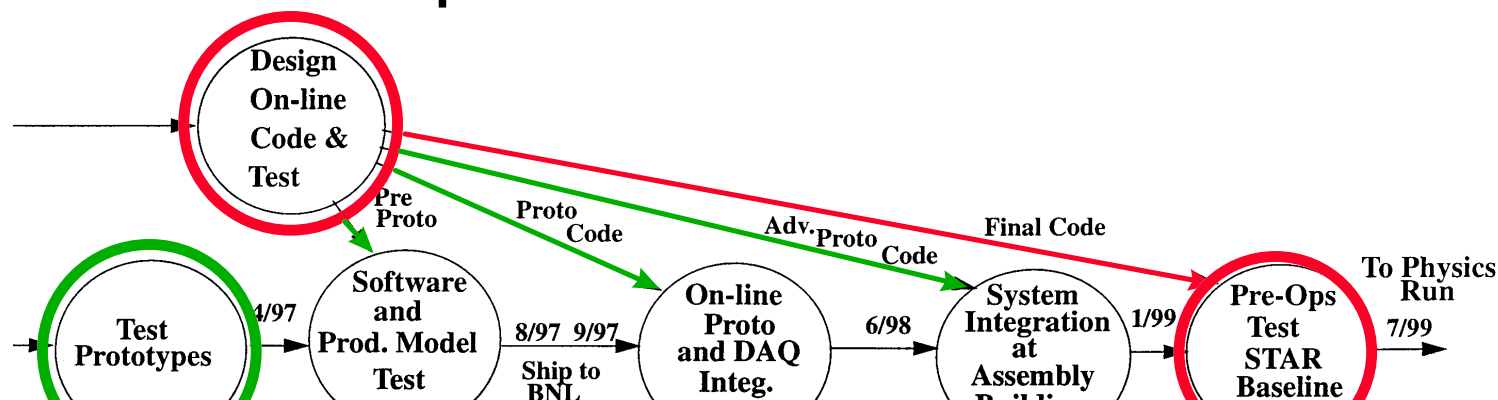
Replace prototype components with final versions as they become ready.

Tests:

Subsystem groups (daq, trigger, tpc, svt, ...) are able to perform individual tests and integrated tests as needed.



Pre-Ops Test STAR Baseline



Deliverables:

Fully functioning software.

Bug fixes and enhancements to monitoring capabilities provided by detector groups.

Tests:

Operator is able to run full system.

Subsystem groups (daq, trigger, tpc, ...) are able to perform individual tests and integrated tests as needed.



Issues from 1995 TAC

- Primary issue from 1995 is integration with slow controls.
 - This is addressed with the definition of slow controls as the low level hardware interface with separate slow controls components for different hardware.
 - The on-line software provides the top level control and configuration handling that deals with inter-subsystem sequencing.
- Second issue is manpower.
 - This is still being addressed with an active effort to build an on-line group at BNL.



Concerns

- Manpower
 - On-line needs at least two full time dedicated people now, as well as additional contributions from the collaboration (post-docs, etc.).
- Interface to off-line and RCF
 - On-line data handling needs to integrate smoothly with off-line and RCF (effort needed here).
 - On-line event processing for monitoring & calibration is essentially the same as for off-line. There is a possibility for shared software if it can be coordinated.



Outlook

- If full time two dedicated full time people begin soon (leader + developer),
- and additional collaboration efforts are brought in within a year
- then on-line software should be able to achieve its goals.